START

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 169262

Proj. ECN

2. ECN Category (mark one)							
Supplemental	[]	Change ECN	[]	Supersedure	[]		
Cancel/Void	[]	Direct Revision	[x]	Temporary	[]	Discovery	[]

3. Originator's Name, Organization, MSIN, and Telephone No.	4. Date
C. M. LOLL, Tank Farms Environmental Engineering, R1-51, 3-5039	November 17, 1992

5. Project Title/No./Work Order No.	6. Bldg./Sys./Fac. No.	7. Impact Level
242-S EVAPORATOR STEAM CONDENSATE SAMPLING AND ANALYSIS PLAN	N/A	3EQ

8. Document Number Affected (include rev. and sheet no.)	9. Related ECN No(s).	10. Related PO No.
WHC-SD-WM-EV-071, REV. X0 TEW 11/18/92	N/A	

11a. Modification Work	11b. Work Package Doc. No.	11c. Complete Installation Work	11d. Complete Restoration (Temp. ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

THE ENTIRE DOCUMENT, WHC-SD-WM-EV-071, REV. 0, IS BEING REPLACED WITH WHC-SD-WM-EV-071, REV. 1

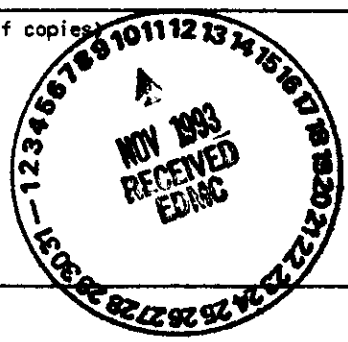
13a. Justification (mark one)							
Criteria Change	[X]	Environmental	[]	Facilitate Const.	[]		
Design Error/Omission	[]	Design Improvement	[]	As-Found	[]	Const. Error/Omission	[]

13b. Justification Details

TEXTUAL REVISIONS/FORMAT CHANGE BASED ON COMMENTS FROM ENVIRONMENTAL REGULATORS.

14. Distribution (include name, MSIN, and no. of copies)

SEE ATTACHED DISTRIBUTION



RELEASE STAMP

OFFICIAL RELEASE
BY WHC
DATE DEC 01 1992
Sta 4
5

A-7900-013-2 (11/88) (EF) GEF095
Engineering Change Notice

A-7900-013-1 (11/88)

ENGINEERING CHANGE NOTICE	Page 2 of 2	1. ECN (use no. from pg. 1) 169262

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[N/A] $	Additional	[N/A] $	Improvement	[N/A]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]		[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

20. Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER		
Cog./Project Engineer *	CM Foll TFEE	11/17/92	PE		
Cog./Project Engr. Mgr. *	CM Foll for GT Berlin per telecon	11/18/92	QA		
QA *	Tom Whelan	11/18/92	Safety		
Safety (POST REVIEW)*			Design		
Security			Other	Sangiorgi Mojolabs	11/19/92
Proj. Prog./Dept. Mgr. *	[signature]	11/20/92		[signature] for CD Morrison	
Def. React. Div.					
Chem. Proc. Div.			HASM	Michelle Hendrix	11/19/92
Def. Wst. Mgmt. Div.			DEPARTMENT OF ENERGY		
Adv. React. Dev. Div.			*		
Proj. Dept.					
Environ. Div.	[signature]	11-19-92	ADDITIONAL		
IRM Dept.					
Facility Rep. (Ops.)	James E. [signature]	11-19-92			
Other 242-S COG	[signature]	11/19/92			
Process Eng	[signature]	11/19/92			

9313089.2010

INFORMATION RELEASE REQUEST

References: WHC-CM-3-4

COMPLETE FOR ALL TYPES OF RELEASE

Purpose

- [ ] Speech or Presentation (Check only one suffix)
  - [ ] Full Paper
  - [ ] Summary
  - [ ] Abstract
  - [ ] Visual Aid
- [ ] Speakers Bureau
- [ ] Poster Session
- [ ] Videotape
- [ ] Reference
- [ ] Technical Report
- [ ] Thesis or Dissertation
- [ ] Manual
- [ ] Brochure/Flier
- [ ] Software/Database
- [ ] Controlled Database
- [X] Other

New ID Number: N/A

Existing ID Number (include revision, volume, etc.): WHC-SD-WM-EV-071 Rev. 1

If previously cleared, list ID number: N/A

Date Release Required: 11/18/92

Title: 242-S EVAPORATOR STEAM CONDENSATE SAMPLING AND ANALYSIS PLAN

Unclassified Category: UC-

Impact Level: 3E Q

COMPLETE FOR SPEECH OR PRESENTATION

Title of Journal: N/A

Group or Society Sponsoring: N/A

Date(s) of Conference or Meeting: N/A

City/State: N/A

Will proceedings be published? [ ] Yes [X] No

Will material be handed out? [ ] Yes [X] No

Title of Conference or Meeting: N/A

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	[ ]	[X]			
Patent - General Counsel	[X]	[ ]	S M BERGLIN	S M Berglin	11/20/92
Legal - General Counsel	[X]	[ ]			
Applied Technology/Export Controlled Information or International Program	[ ]	[X]			
WHC Program	[X]	[ ]	Dwayne R Spear	Dwayne R Spear	11/20/92
Communications	[ ]	[X]			
DOE-RL Program	[X]	[ ]	L. S. Mamula	Janet May	11/23/92
Publication Services	[X]	[ ]	M. P. CURRY	M. P. Curry	11/20/92
Other Program	[ ]	[X]			
References Available to Intended Audience	[X]	[ ]	See Author's signature below		
Transmit to DOE-HQ/Office of Scientific and Technical Information	~~[X]~~	~~[X]~~	R. L. HIGGINS	R L Higgins	11/23/92

Information conforms to all applicable requirements. The above information is certified to be correct.

Author/Requestor (Printed/Signature): C. M. Loll Craig M Loll — Date: 11/17/92

Responsible Manager (Printed/Signature) — Date: 11/18/92

G. T. Berlin C M Loll for G T Berlin per telecon

Intended Audience

[ ] Internal [ ] Sponsor [X] External

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

Stamp is required before release. Release is contingent upon resolution of mandatory comments.

APPROVED FOR PUBLIC RELEASE D.B. 11/24/92

Date Received 11/20/92

BD-7600-062 (4/90) (EF) WEF074
Information Release Request

Part 1

SUPPORTING DOCUMENT

1. Total Pages 20

2. Title	3. Number	4. Rev. No.
242-S EVAPORATOR STEAM CONDESATE SAMPLING AND ANALYSIS PLAN	WHC-SD- WM-EV-071	2

5. Key Words	6. Author
Liquid effluent sampling, analysis, 242-s evaporator, steam condensate	Craig M Loll Name (Type or Print) Craig M Loll Signature 7C420 / A2088 Organization/Charge Code

7. Abstract

The source, volumes and controls for the contributors to the 242-S Evaporator steam condensate effluent are described. The information is used to justify the sampling point and frequency for this stream. Sample collection methods, sample handling requirements, constituents for which the samples will be analyzed and the associated quantitation limits are specified in the plan.

APPROVED FOR PUBLIC RELEASE 11/24/92

8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.

PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.

Legends removed per WHC Legal KMS 11/24/92

DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

9. Impact Level

3EQ

10. RELEASE STAMP

OFFICIAL RELEASE BY WHC (5)
DATE DEC 01 1992
Sta. 4

RECORD OF REVISION	(1) Document Number WHC-SD-WM-EV-071	Page 1

(2) Title
242-S EVAPORATOR STEAM CNDENSATE SAMPLING AND ANALYSIS PLAN

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT # 152781, 9/27/91		
1 RS	REV. 0 SUPERCEDED BY ECN # 169262	C M Zoll	concur for G T Berglin per Telecon 11/19/92

WHC-SD-WM-EV-071, Rev 1

TRADEMARK DISCLAIMER

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

242-S EVAPORATOR STEAM CONDENSATE SAMPLING AND ANALYSIS PLAN

November 16, 1992

Tank Farms Environmental Engineering

TABLE OF CONTENTS

LIST OF FIGURES

ABBREVIATIONS & ACRONYMS

AMU	AQUEOUS MAKEUP
ASTM	AMERICAN SOCIETY FOR TESTING MATERIAL
BCE	B PLANT CHEMICAL SEWER
CBC	B PLANT COOLING WATER
CERCLA	COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION & LIABILITY ACT
CFR	CODE OF FEDERAL REGULATIONS
COC	CHAIN OF CUSTODY
COD	CHEMICAL OXYGEN DEMAND
DOE	U.S. DEPARTMENT OF ENERGY
DOT	DEPARTMENT OF TRANSPORTATION
DQO	DATA QUALITY OBJECTIVE
DST	DOUBLE SHELL TANKS
Ecology	WASHINGTON STATE DEPARTMENT OF ECOLOGY
ECWS	EMERGENCY COOLING WATER SYSTEM
EDMC	ENVIRONMENTAL DATA MANAGEMENT CENTER
EDTA	ETHYLENEDIAMINETETRAACETIC ACID
EMO	ENVIRONMENTAL MANAGEMENT OPERATIONS
EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY
ESQA	ENVIRONMENTAL SERVICES QUALITY ASSURANCE
ETP	EFFLUENT TREATMENT PROGRAMS
gpm	GALLONS PER MINUTE
HEIS	HANFORD ENVIRONMENTAL INFORMATION SYSTEM
HPLC	HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY
HPT	HEALTH PHYSICS TECHNICIAN
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
ICP	INDUCTIVELY COUPLED PLASMA
LEMIS	LIQUID EFFLUENT MONITORING INFORMATION SYSTEM
MCL	MAXIMUM CONTAMINANT LEVEL
MCLG	MAXIMUM CONTAMINANT LEVEL GOAL
MSDA	MATERIAL SAFETY DATA SHEET
NCR	NONCONFORMANCE REPORT
OSM	OFFICE OF SAMPLING AND MANAGEMENT
PCB	POLYCHLORINATED BIPHENYL
psi	POUNDS PER SQUARE INCH
QA	QUALITY ASSURANCE
QAPjP	QUALITY ASSURANCE PROJECT PLAN
QAPP	QUALITY ASSURANCE PROGRAM PLAN
QC	QUALITY CONTROL
RCRA	RESOURCE CONSERVATION AND RECOVERY ACT
SAP	SAMPLING AND ANALYSIS PLAN
S&ML	SAMPLING AND MOBILE LABORATORIES
SD	SUPPORTING DOCUMENT
SDWS	SECONDARY DRINKING WATER STANDARDS
SML	SAMPLING AND MOBILE LABORATORY
SOW	STATEMENT OF WORK
TDS	TOTAL DISSOLVED SOLIDS
TFEE	TANK FARMS ENVIRONMENTAL ENGINEERING
TOC	TOTAL ORGANIC CARBON
TOX	TOTAL ORGANIC HALOGENS
TPA	TRI-PARTY AGREEMENT
VOA	VOLATILE ORGANIC ANALYSIS
WAC	WASHINGTON ADMINISTRATIVE CODE
WESF	WASTE ENCAPSULATION AND STORAGE FACILITY
WHC	WESTINGHOUSE HANFORD COMPANY
WM	WASTE MANAGEMENT

A. SAMPLING OBJECTIVES

A.1 Introduction

This Sampling and Analysis Plan (SAP) is to establish the requirements and guidelines used by Westinghouse Hanford Company (WHC) in implementing an upgraded Liquid Effluent Sampling Program for the 242-S Evaporator Steam Condensate Sampling & Analysis Plan. The effluent contains liquids from ventilation system heating and cooling, emergency steam turbine cooling and condensate, and moisture condensate from the instrument air system. This effluent stream does not contain liquids from sanitary sources.

The requirements in this document are in addition to the, Liquid Effluent Sampling Quality Assurance Program Plan (QAPP), WHC-SD-WM-QAPP-011 (WHC, 1992). The QAPP (WHC, 1992) provides the Hanford Site guidelines and requirements for special high quality liquid effluent sampling activities, which include: overall scope and direction to the sampling activities, the control of samples, the laboratory analyses, the processing of data, the control of data, the quality assurance requirements, and corrective actions used in obtaining high quality data for the Liquid Effluent Sampling Program. The high quality data are obtained from controlled grab samples called Liquid effluent characterization samples that are used to characterize the distribution of analytes in the effluent and to determine which analytes may require further monitoring in the future by establishing a routine monitoring program.

The SAP is a facility specific document for describing how the requirements of the QAPP (WHC, 1992) shall be implemented for activities occurring at the facility. The SAP provides a general description and identifies procedures that will be used to execute the work needed to implement the QAPP (WHC, 1992) requirements.

The QAPP (WHC, 1992) was written to allow each facility some flexibility in accommodating the Hanford Site requirements. One primary reason for this flexibility is because of differences in procedures for surveying radiation sources at each facility. The SAP is to identify facility specific exceptions to the QAPP (WHC, 1992), which include changes to the required list of analytes. The QAPP (WHC, 1992) requirements for chain of custody, laboratory analysis, validation of data, control of records, and corrective actions shall not be modified by this SAP.

A.2 Objectives

The primary objectives of the SAP are to:

- Obtain several sets of known quality data to develop a long term sampling plan.
- Confirm the analyte concentration data reported in the stream specific reports and the conclusion that the stream does not contain dangerous waste as defined in Washington Administrative Code (WAC) 173-303, Dangerous Waste Regulations, as amended.

The secondary objectives are to:

- Provide highly quality controlled data for the evaluation of routine process sampling methods so that existing data can be evaluated and utilized.
- Provide solid waste loading data to support development of waste water treatment projects and groundwater remediation studies.
- Provide historical data for the Washington Administrative Code (WAC) 173-240 engineering reports and (WAC) 173-216 waste discharge permit applications.

A.3 Approach

This SAP has been structured to obtain high quality sampling data that will identify the types of contaminants found in the liquid effluent stream from the 242-S Evaporator Facility. The data will come from liquid effluent characterization samples which are taken as grab samples. Quality controlled, verifiable methods shall be used in collecting the sample media, transporting the sample media, analysis of the media, the statistical evaluation of the analytical results, and the storing of sample records. All liquid effluent characterization sampling shall be performed according to WHC approved written procedures. The procedures shall comply with the requirements of Test Methods for Evaluating Solid Waste, EPA SW-846, latest revision.

All personnel associated with collection of liquid effluent characterization samples, processing of the samples, processing of the data, and control of records shall comply with the procedures related to their responsibilities. The personnel shall sign a document verifying that they have read and understand the procedures. The signed documents shall become part of the training records.

Grab samples will be taken for liquid effluent characterization sampling because some constituents, such as volatile organics and ammonia, are unstable with time. Grab samples are used to minimize the holding time from sample collection to laboratory analyses to prevent a significant loss of these unstable analytes.

Liquid effluent characterization samples shall be obtained at least twice during the twelve months following approval of this Plan. In addition, characterization samples shall be obtained on the raw water supply system. These samples are to be analyzed for chemical constituents selected from Appendix A of the QAPP (WHC, 1992) that are of concern for designating dangerous waste characteristics and for preparation of Discharge Permits. Chemical analytes that are not found, will be eliminated from the list of analytes in future liquid effluent characterization samples. Chemical analytes found in both the effluent and raw water at equivalent concentration levels will also be eliminated from the list of analytes. The amended list shall be a Class 3 Change in accordance with the Hanford Tri-Party Agreement as stated in the QAPP (WHC, 1992).

Chemical analytes found to be added by 242-S Evaporator Facility operations with significant measurable quantities shall be included in a list of analytes for the implementation of a routine monitoring sampling program. The document used for determining significance in amending the routine list of analytes is Chapter 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington.

This Sampling and Analysis Plan (SAP) has been prepared for the 242-S Evaporator Steam Condensate effluent stream as required by the September 9, 1991, amendments to the Hanford Federal Facility Agreement and Consent Order, (Ecology et al. 1989), otherwise known as the Tri-Party Agreement (TPA). In addition, "Consent Order No. ED-91NM-177 For the Permitting of Liquid Effluent Discharges Under the Washington Administrative Code (WAC) 173-216," requires the submittal of SAP's for the permitting of effluent wastewater streams.

B. SITE BACKGROUND

This section contains a brief facility description of the 242-S Evaporator Facility, a description of its processes, the resulting wastewater discharges, and the receiving site, the 216-U-14 Ditch.

B.1 242-S Evaporator Facility Description

The 242-S Evaporator Facility is located in south-central Washington, at the southwest end of the 200 West Area of the Hanford Site. The 216-U-14 Ditch is located northwest of the 242-S Facility (see Figure 2-2).

The 242-S Evaporator facility started operation in 1973, but has remained in a shutdown mode since 1980. The purpose of this facility was to reduce the volume of low-level, radioactive waste through evaporation and concentration.

In the original process, waste was heated using steam on the shell side of a reboiler. A portion of the heated waste would vaporize when it entered the vapor-liquid separator which was operated at a reduced pressure. Vapors from the separator were condensed using raw water on the tube side of the condenser. When sufficient concentration of the waste was achieved the slurry was discharged back to the tanks.

This facility has not stored or processed waste in over ten years. It is now used primarily as a surveillance shift office by Tank Farms operations personnel. They provide round-the-clock support for the various West Area facilities which are maintained by Tank Farms.

B.2 Stream Description

Wastewater from 242-S Evaporator exits the building in two separate pipelines that combine about 100 feet west of the main building. The only contributor to the main pipeline is the steam condensate and cooling water from the standby steam turbine. Steam condensate from the HVAC room is the only remaining contributor to the smaller drain line that joins the main line. The combined line then runs northwest to the 216-U-14 ditch. The configuration of the stream contributors are depicted in Figure 2-1.

The liquid effluent wastestream consists entirely of non-contact steam condensate and cooling water. Hard piping of contributors from the source to discharge point provides a control against the inadvertent addition of hazardous material/waste to this effluent stream. In addition, there are no hazardous materials presently used at this facility, with the exception of occasional household cleaning agents. The only contaminants which are expected to be present are those found in the original source and traces of corrosion products from the piping system such as zinc, copper, nickel, chromium and lead. The current stream contributors are illustrated in Figure 2-1, and are described in the following subsections.

B.2.1 HVAC Steam Condensate

The HVAC system conditions air for use in the 242-S building. The use of heating and cooling equipment is seasonal based on the outside ambient air temperature. Heating or cooling the air is required to provide the proper temperature for occupied areas as well as protect equipment. Incoming air is heated using steam heaters and air washers are used to provide evaporative cooling.

The steam heaters function by blowing air over steam filled coils in the heater. Condensate which is formed in the closed coils is discharged through a steam trap into a drain line. Drain lines from all the heaters in the HVAC room combine in one pipe leaving the room. The estimated steam condensate discharge from operating this piece of equipment is 5 gpm.

An evaporative cooler is used on a seasonal basis to provide the proper temperature for personnel occupied areas as well as protect equipment. In the HVAC coolers, water is sprayed into the air stream and the subsequent evaporation and saturation cools the air to the desired temperature. Any water not evaporated is collected at the bottom of the washer and a pump recycles it to the sprayer. The only effluent from the washer is an overflow drain line. The overflow drain line joins the steam condensate drain lines. Any flow from this contributor is intermittent and dependent upon season temperatures. All equipment and lines are in a room separate from the area of the facility that was used for waste processing. No activities are carried out in the HVAC room that would cause the introduction of contaminants to the streams.

Figure 2-1. 242-S Evaporator Wastestream Configuration

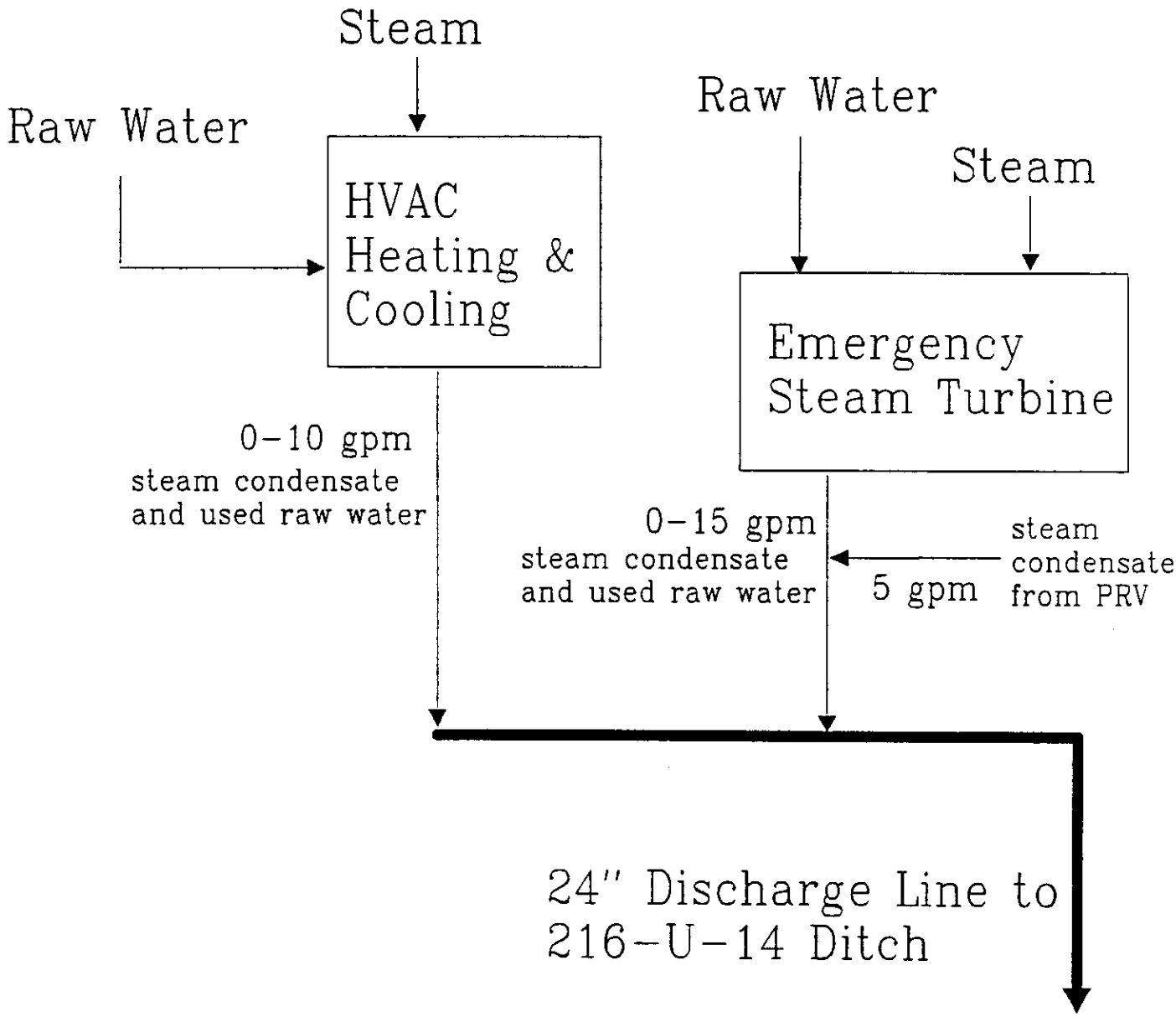
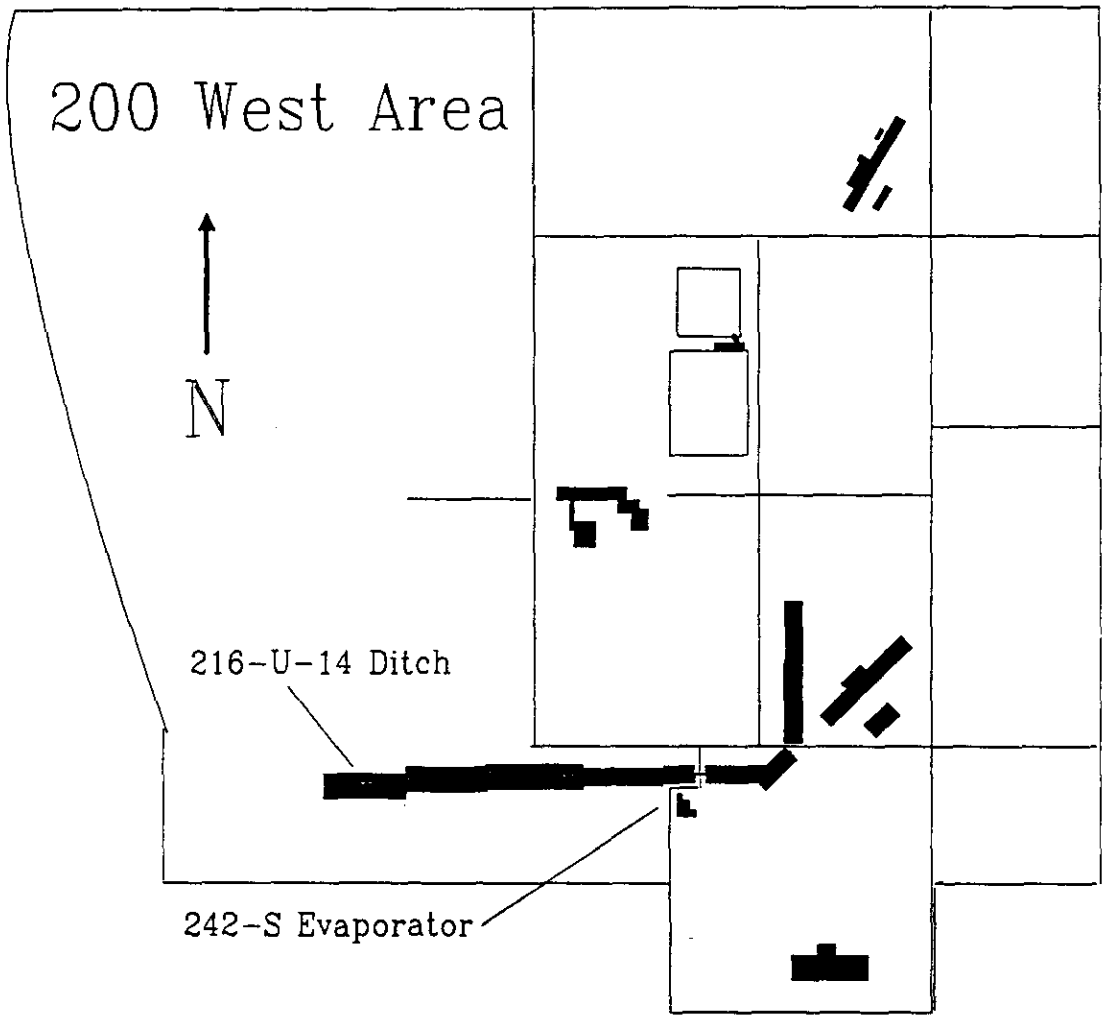


Figure 2-2. 242-S Evaporator and 216-U-14 Ditch Location



B.2.2 Steam Turbine Condensate

To assure safe working conditions the 242-S building is maintained at a slight negative pressure by the building ventilation system. Following the loss of electricity to the normal ventilation (HVAC) system, steam drives an emergency turbine that maintains safe ventilation (and pressure differentials) in the various facility zones. The steam turbine is activated whenever there is a power outage at the building and during any maintenance to the primary fans.

The steam is supplied from the 200 West Area Powerhouse. The various steam condensate and cooling water contributions from the emergency turbine drain to a sump in the floor of the turbine building. The sump gravity drains to the main drain line, which discharges to the 216-U-14 Ditch.

The design maximum discharge for steam condensate from the turbine is 8 gpm. The actual discharge of steam turbine condensate is estimated at 1 gal/hr, continuously. The steam turbine is continuously in contact with steam in order to keep it warm. A steam trap allows continuous drainage of steam condensate from the supply line to the sump, whether the turbine is operational or not.

When the turbine is operational, the exiting steam exhausts through a vent, and the condensate from the vent drains to the sump. A quarterly functional test (several hours of run time) is performed on the steam turbine. The turbine also activates during maintenance activities on the primary electric fan.

In addition to the steam condensate, there is a small contribution of cooling water from the emergency steam turbine. Lubricant oil is used to cool and lube the bearings in the turbine. The lube oil is pumped through a closed loop cooling system. It is cooled in a heat exchanger where one-pass, non-contact cooling water, flowing at about 5 gal/min, removes the heat from the oil. This cooling water then flows to the sump that the steam condensate from the turbine collects in, and from this point the combined stream drains to the main drain line which empties into the 216-U-14 Ditch. The cooling water stream is controlled by a solenoid valve which only opens when the steam turbine is in operation.

An additional contribution to the turbine building sump is the temporary discharge from a steam trap for a pressure reducing valve (PRV) on the main steam line which services the 242-S Evaporator Facility. Originally, the condensate from this steam trap discharged into a french drain, however, it was rerouted to the 242-S turbine building sump several years ago. The contribution from this steam trap to the effluent wastewater stream is estimated as 5 gpm, continuously. Current plans are to move this PRV and the associated steam trap to another location on the steam supply line and route the condensate to a new french drain.

B.2.3 Air Sample Pump Seal Water (discontinued)

The purpose of the air sample pump was to draw air samples from various areas of the 242-S Evaporator facility to identify abnormal levels of airborne radioactive material. Raw water was used in the air-sample pump to maintain a positive water seal within the pump. The seal water for the air sample pump discharged at an average estimated rate of 7 gpm.

An evaluation was performed which determined that the 242-S Facility no longer required continuous air monitoring, so the air sample pump was taken off line, permanently. This stream was officially eliminated as of September 30, 1992.

B.2.4 Air Compressor Cooling Water (discontinued)

The two, water-cooled air compressors are currently being replaced at the 242-S facility. The air compressors used one-pass, raw water, to cool working parts within the equipment. The estimated discharge from the compressors was 5 gpm, on a continuous basis. They are being replaced with two, closed-loop air compressors which use a recirculating ethylene glycol-water mixture as the coolant. While the new compressors are being installed, the facility air is being supplied by a single, air-cooled, portable diesel compressor. This compressor makes no contributions to the 242-S Evaporator steam condensate wastestream.

In addition to the replacement of the air compressors, the steam heated air dryer, which contributed a small amount of steam condensate and air moisture blowdown (less than 1 gal/min) has also been replaced. The new air dryer uses an electric heater, rather than steam, to remove collected moisture from the adsorption media. Therefore, the steam condensate from this piece of equipment no longer contributes to the effluent wastestream.

The only remaining contributions from the process/instrument air system is blowdown from the air receiver tank. The source of the water in the blowdown is water vapor from the air that condenses as the air is compressed. Flow contributions from this source is estimated at less than 1 gallon per day.

B.3 Effluent Disposal Site Description

The 216-U-14 Ditch was constructed in 1944 as a percolation trench to dispose of low-level radioactive liquid effluent consisting of UO_3/U Plant wastewater and the 242-S Evaporator wastestream. It is located approximately 200 ft south of 16th Street, and 200 ft west of Beloit Avenue in 200 West Area. A dedicated, 24 inch used raw water pipeline, transports the 242-S Evaporator wastewater stream about 300 ft north, to the 216-U-14 ditch. The ditch consists of about 150 ft of 6-in. perforated fiberglass reinforced pile, laid in a gravel bed, and covered with a polyethylene barrier, backfilled, and stabilized.

C. RESPONSIBILITIES

The responsibility descriptions below are related to activities occurring at the 242-S Evaporator Facility. Overall responsibilities covering other areas are the same as found in the QAPP (WHC, 1992).

Tank Farm Environmental Engineering

- Prepare the Sampling and Analysis Plan.
- Ensure procedures are updated to support the sampling activities.
- Provide the Sampling Task Leader.
- Initiate scheduling of personnel required for sampling.
- Provide technical support for sampling activities.
- Review data logs and sampling activities.
- Surveil chain of custody activities.
- Review liquid effluent characterization sampling data for completeness and consistency.
- Ensure liquid effluent characterization sampling data and flow information are transferred to the Effluent Treatment Programs (ETP) for filing with Environmental Data Management Center (EDMC).

The data in files shall include copies of field notes, sampling logs, process flow records, analytical results, and validation calculations.

Tank Farm Operations

- Approve Sampling & Analysis Plan.
- Provide a trained operator for escort during liquid effluent characterization sampling.

Tank Farms Health Physics

- Provide a Health Physics Technician (HPT) for radiation surveying of liquid effluent characterization sample packages.
- Provide the Radiation Work Permit (RWP) instructions for zone entry.
- Verify radiation worker training requirements of sampling personnel.

Sampling and Mobile Laboratories

- o Approve Sampling & Analysis Plan.
- o Provide trained samplers for liquid effluent characterization sampling activities. One sampler shall have a WHC Certificate of Qualification from the Sampling & Mobile Laboratories organization. The certified sampler shall direct liquid effluent characterization sampling, packaging and shipping.
- o Prepare the Plant liquid effluent characterization sampling and packaging procedure.
- o Document sampling activities in a log book.
- o Transport liquid effluent characterization samples to laboratory or shipping center.
- o Initiate "Chain of Custody" documentation for liquid effluent characterization samples.
- o Package liquid effluent characterization samples for shipping.
- o Ensure copies of field logs and other sampling data sheets are filed with the sample task leader.

Quality Assurance (QA)

- o Approve Sampling & Analysis Plan.
- o Provide surveillance of the liquid effluent characterization sampling program.

D. SAMPLING LOCATION AND FREQUENCY

D.1 Sampling Location

The contributors to this stream consist exclusively of non-contact steam condensate and cooling water. This facility is in a shutdown\standby mode, therefore, the contributors to the effluent wastestream are not used in waste processing operations, and are not subject to the introduction of hazardous materials. They are hardpiped from source to sampling point and are not expected to vary in individual composition. Based on this knowledge of the contributors, individual contributor sampling will not provide additional useful data. Total stream composition data is the most valuable in meeting the objectives stated in Section A.2.

Liquid effluent characterization samples of the combined stream will be obtained at the pipe discharge point to the 216-U-14 Ditch.

In addition to the effluent sampling, raw water sampling will be performed at several facilities in the 200 West Area to provide raw water data. The results from the raw water sampling at the various Hanford facilities will be pooled to create a raw water baseline. Once the overall composition of site raw water is determined, one location will be chosen to obtain any additional raw water samples.

D.2 Frequency

Two characterization samples shall be taken during the first year following the approval of this document. Two more characterization samples shall be taken in the following year. The SAP shall be revised based on the results of the baseline characterization sampling. This sample frequency is justified as this stream is a low priority, low flow wastestream. The contributors to the stream are consistent in the current operational mode and no change in operating status is expected. A change in stream configuration for this facility, such as the elimination of a major contributor, shall be evaluated for additional samples to assess any changes to the overall stream.

E. SAMPLE IDENTIFICATION

E.1 Liquid Effluent Characterization Sample Labeling

Sample labels for liquid effluent characterization samples shall be furnished by the sampling team from the Sampling and Mobile Laboratories. The labels will require the following information to be recorded by a member from the sampling team: identification of the person in charge of collecting the sample; unique sample identification number; the sample matrix; the preservative added; date and time the sample was collected; the place the sample was collected; the stream identification; and the analysis to be performed on the sample. The unique sample number shall be obtained from the Hanford Environmental Information System (HEIS). In addition, each bottle shall be identified with a bar code sticker attached to the bottle by the bottle manufacturer. The bar code shall identify the bottle lot number and individual bottle number.

F. SAMPLING EQUIPMENT AND PROCEDURES

F.1 Effluent Characterization Samples

The liquid effluent characterization sampling activities will comply with a specific procedure prepared for the sampling of the liquid effluent streams from the 242-S Evaporator steam condensate effluent stream. This procedure will be based on recommended practices found in SW-846, Test Methods for Evaluating Solid Waste. The formal sampling procedure for this stream is being developed by TFEE and the S&ML and will be completed and issued prior to the first sampling event. The sampling procedure identifies specific requirements which include the following: sampling location, description of sampling equipment, containers, and reagents, safety precautions including personal protective equipment, and specific steps for collecting the samples. Sampling will be surveilled at random by a cognizant Quality Assurance person.

Sampling from the end of the discharge pipe will be done by the modified bailer method. The samples will be collected in the bailer and then used to fill the appropriate bottles. Sample bottles shall be new, commercially available, certified precleaned containers. The sample shall be drawn only with a new bottle. Sampling equipment shall not require maintenance and calibration procedures.

Preservative required for liquid effluent characterization samples will be vendor supplied and added to the containers in a laboratory environment prior to being taken in the field. The caps will be sealed to the containers with tamper evident tape.

The samples shall be cleaned and surveyed for surface radioactivity. The sample will be packaged in accordance with the, Environmental Investigations and Site Characterization Manual, WHC-CM-7-7, procedure EII 5.11, "Sample Packaging and Shipping." The samples will be placed in a cooler containing ice. The cooler shall become part of the sample packaging.

Field logs will be completed per the, Environmental Investigations and Site Characterization Manual, WHC-CM-7-7, procedure EII 1.5 "Field Logbooks" at the time of sampling by the sampling team. A field logbook shall be maintained which contains information pertinent to the sampling and the information shall be quality record documents.

Sampling event documentation that has been validated will be transferred to Work Control and Data Management for inclusion in the EDMC files and to be prepared for public release. Field measurements will be made for conductivity and pH at the time of sampling. The results of the field measurements are entered into the field logbook.

G. SAMPLE HANDLING AND ANALYSIS

G.1 Liquid Effluent Characterization Samples

Liquid effluent characterization samples will be analyzed for the following:

Analyte List	Method of Analysis
Sulfides	EPA method 9030
Semi-volatile organics (semi-VOA)	EPA method 8270
Volatile organics (VOA)	EPA method 8240
Total organic halides (TOX)	EPA method 9020
Herbicides	EPA method 8150
Organophosphorus Pesticides	EPA method 8140
Polychlorinated biphenyls (PCB) /organochlorine pesticides	EPA method 8080
Inductive coupled plasma metals (ICP)	EPA method 6010
Graphite furnace atomic absorption (AA) metals	
Arsenic	EPA method 7060
Lead	EPA method 7421
Mercury	EPA method 7470 (cold vapor)
Selenium	EPA method 7740
Tin	EPA method 7870

Analyte List	Method of Analysis
Total cyanide	EPA method 9010/9012
Hexavalent Chromium	EPA method 7196
Bromide	EPA method 320.1
Chloride	EPA method 325.1, .2, .3
Fluoride	EPA method 340.1, .2
Total oil and grease	EPA method 9070
Total phenols	EPA method 9065/9066/9067
Biological oxygen demand (BOD)	EPA method 405.1
Chemical oxygen demand (COD)	EPA method 410.1, .2, .3, .4
Total organic carbon (TOC)	EPA method 9060
Phosphorus	EPA method 365.2, .3
Nitrogen, nitrate, nitrite	EPA method 353.1, .2, .3
Ammonia	EPA method 350.1, .2
Total dissolved solids (TDS)	EPA method 160.1
Total suspended solids (TSS)	EPA method 160.2
Alkalinity	EPA method 310.1/310.2
pH	EPA method 9040
Conductivity	EPA method 9050
Total alpha/beta	WHC approved laboratory method
Radionuclides	WHC approved laboratory method
Plutonium-238, 239, 241	
Americium-241	
Strontium-89, 90	
Cesium-137	
Ruthenium-103	
Ruthenium-Rhodium-106	

The handling and preparation of samples will comply with the procedures found in the, Environmental Investigations and Site Characterization Manual, WHC-CM-7-7. When an analysis requires that a preservative be added to the sample bottle, the presevative is added in a clean laboratory environment prior to traveling to the sampling site. At the time of sample bottle preparation a chain of custody (COC) form will be initiated and will accompany the sample bottle into the field. A COC form will accompany each liquid effluent characterization sample, which may consist of several containers. The COC will account for each container. The sample bottles are stored in a cooler sealed with tamper evident tape and all custody transfers are noted on the bottle COC form.

Once a liquid effluent characterization sample has been drawn it must be in the physical control or view of the custodian, locked in an area where it can not be tampered with, or prepared for shipping with tamper-proof tape applied. Physical control includes being in the sight of the custodian, being in a room which will signal an alarm when entered, or locked in a cabinet.

When more than one person is involved in sampling, one person shall be designated and only that person signs as sampler. This person is the custodian until the samples are transferred to another location or group and shall sign when releasing the samples to the designated receiver.

The preparation of either a single or a group of samples for shipment to a laboratory shall comply with the procedure EII 5.11 "Sample Packaging and Shipping." Samples going off-site for analysis will conform to all federal regulations governing shipment.

The approved laboratory shall designate a sample custodian and a designated alternate responsible for receiving all samples. The sample custodian or his alternate shall sign and date all appropriate receiving documents at the time of receipt and at the same time initiate an internal Chain of Custody form using documented procedures. A continuous chain of custody will be maintained from the time of sampling until final disposition of all samples.

Liquid effluent characterization samples will be collected in commercially available, individually certified, precleaned containers. The certification of the precleaned condition shall accompany the bottle. The necessary containers, sample volumes, and preservatives for the analyses are identified per the QAPP (WHC, 1992).

The samples shall not be analyzed for total and fecal coliform because there are no sanitary sewer connections. Ruthenium-103, Ruthenium-Rhodium-106, and Tin-113, are identified by the same analytical method which identifies strontium and cesium.

Due to radioactive shipment requirements and as low as reasonably achievable (ALARA) practices on site, the samples must be checked for total radioactive activity before being allowed off site. For this reason, very short holding times on analyses such as hexavalent chromium and BOD, may be violated.

The samples will be routed to an approved participant contractor or subcontractor laboratory for analysis. The data will be considered representative so long as at least 90 percent of the data points meet the established requirements in the laboratory contract for precision and accuracy. Data which does not meet this objective will be reviewed to determine whether the data can be used or whether corrective action should be taken. If necessary, corrective action will consist of repeating the sampling and analysis activity.

Data and record information that has been validated will be transferred to Work Control and Data Management for inclusion in the EDMC files and to an approved computer data file (LEMIS) when it becomes available.

REFERENCES

Ecology, EPA, and DOE, 1989, Hanford Federal Facility Agreement and Consent Order, Washington State Department of Ecology, U.S. Environmental Protection Agency, U.S. Department of Energy, Olympia, Washington.

EPA, 1990, Test Methods for Evaluating Solid Wastes, SW-846, 3rd Edition, Update I, U.S. Environmental Protection Agency/Office of Solid Waste, Washington D. C.

WHC, 1989, Environmental Investigations and Site Characterization Manual, WHC-CM-7-7, Section 5.11, Westinghouse Hanford Co., Richland, Washington.

WHC, 1992, Liquid Effluent Sampling Quality Assurance Program Plan, WHC-SD-WM-QAPP-011, Rev. 3, Westinghouse Hanford Co., Richland, Washington.